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NOTE

Fluoroboro-Bridged Dinuclear Copper(II) Macrocyclic Complexes

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The dialdehydes (Fig. 1) react with diacetylmono-hydrazone-monoxime (Fig. 2) to give the ligands (Fig. 3) which react with CuX_2 ($X = Cl^-, Br^-$) and copper(II) acetate in the molar ratio (1 : 1 : 1) to give the dinuclear copper(II) complexes (Fig. 4) which on further reaction with boron trifluoride in butanol medium yield the dinuclear cyclops (Fig. 5). Characterization has been done on the basis of elemental analyses and spectral studies.

Very recently, an interesting series of 32- and 34-membered macrocyclic trinuclear nickel(II) complexes have been reported from our laboratory[1]. In continuation of our work, we report here a new series of flouroboro-bridged dinuclear copper(II) complexes.

Dialdehydes have been prepared as reported earlier[1-3]. Chemicals used were mainly from Aldrich. Standard procedures were adopted for obtaining physico-chemical data. Analyses agree well with the proposed formulations. The reaction sequence can be represented as shown in Figs. 1–5.

Vibrational spectra of parent precursors (Fig. 4) show ν(C=N) band at 1600 cm^{-1} and ν(N—O) at 1116 and 964 cm^{-1}. Interestingly the ν(C=N) bands appear as a doublet near 1640 adn 1600 cm^{-1} for the dinuclear cyclops. The ν(B—F) appear at 1052 cm^{-1} and ν(B—O) near 1157 and 820 cm^{-1} with their characteristic shape and intensity. The spectral data are scintillating and lead us to propose macrocyclic structure as shown in Fig. 5 for the fluoroboro-bridged complexes.

The dinuclear fluoroboro-bridged macrocycles of copper(II) have subnormal magnetic moments. In polar solvents their electronic spectra show a broad asymmetric weak band in the region 12,500 to 18,000 cm^{-1}. The spectrum was not well resolved to determine the component transitions arising from the chromophore CuO_2N_2 and CuN_4 respectively. Apart from ligand field bands, the copper(II) complexes exhibit two to three charge transfer bands which are well resolved and are located near 25,000 cm^{-1}.

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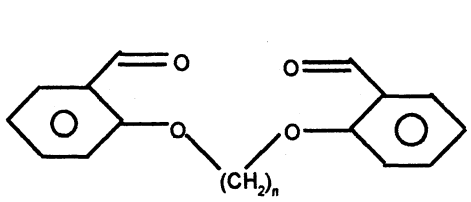

Fig.-1

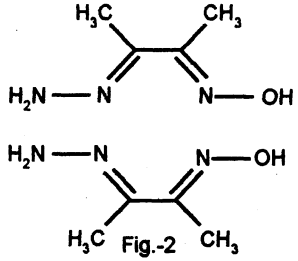

Fig.-2

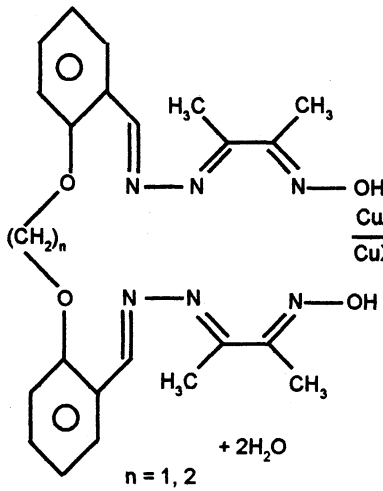

Fig.-3

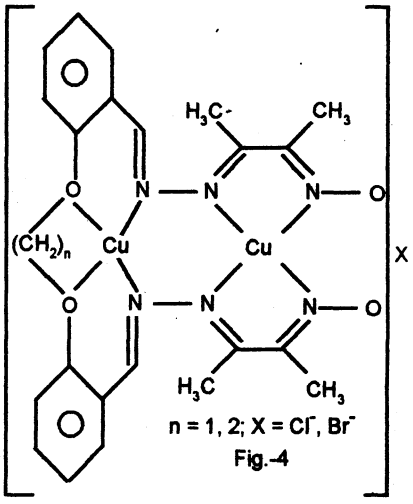

Fig.-4

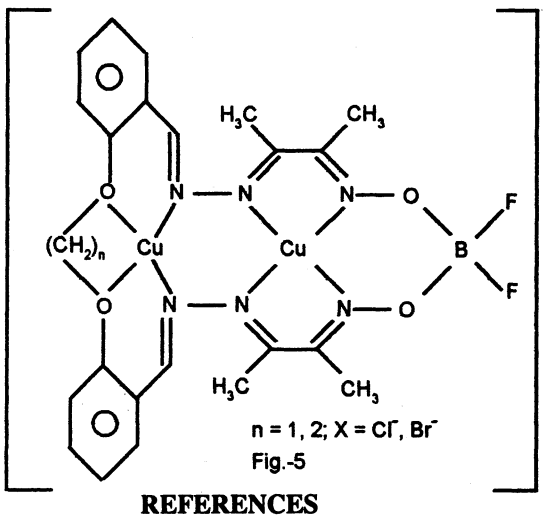

Fig.-5

REFERENCES

1. H.C. Rai, A. Kumar and Veena Kumari, *Asian J. Chem.*, **12**, 625 (2000).
2. M. Green and P.A. Tasker, *Chem. Commun.*, **1968**, 518 (1968).
3. M. Green, J. Smith and P.A. Tasker, *Inorg. Chim. Acta*, **5**, 17 (1971).

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